
Introduction

The Meridian Administration Tools (MAT) system provides the Meridian 1 system administrator with tools to maintain and update the Meridian 1 switch. The MAT system consists of MAT Common Services and several MAT applications, each of which provides specific system management capabilities. This User Guide describes the MAT Traffic Analysis application.

Overview

The MAT Traffic Analysis Module (TAM) enables you to perform the following functions:

- collect traffic data from a specific site's Meridian 1
- maintain a database of collected traffic data
- define report and graph parameters
- generate reports to extract significant information from raw traffic data, such as trunk usage, peak periods, process loads, and junctor and loop traffic

Because some Traffic Analysis functions are used by the entire MAT system, you can access them via their individual icons in the MAT main window, or via the application's main window.

MAT Traffic Analysis includes the following modules:

Profile Editor

Use the Profile Editor to create a profile that defines the type of information contained in each report or graph.

Filter Editor

Use the Filter Editor to define the range of traffic data for a report or graph.

Database Maintenance

Use Database Maintenance to maintain and safeguard the traffic data collected from the Meridian 1.

Data Parser

MAT Traffic Analysis uses the Data Parser to translate raw traffic data dumps collected from the Meridian 1 into database records.

Data Extractor

MAT Traffic Analysis uses the Data Extractor to extract specific traffic data from the traffic database prepared by the Data Parser.

Analytic Engine

MAT Traffic Analysis issues a request to the Analytic Engine to analyze parsed traffic data and send the information to the Report Generator. The request specifies the name of the report, a list of profiles to be used in processing the request, and an output device (either printer or screen).

Report Generator

Use the Report Generator to format the contents of a database file for output as a report or graph to a screen, printer, or file. A report template defines the appearance of the output, and can specify computations such as summaries, subtotals, and totals by page, section, or report.

In addition, Traffic Analysis uses MAT Common Services modules to schedule tasks, manage queues, supervise communications between the MAT system and the Meridian 1, and update the MAT History File.

MAT users

The MAT system is designed for managers of telecommunications equipment and authorized Northern Telecom distributors. This guide is intended for a telecommunications analyst who is familiar with Meridian 1 output and wishes to analyze its data.

This guide assumes you are familiar with PC systems and the Microsoft Windows environment. You should be familiar with the Windows environment before attempting to use the MAT system. A quick review of pertinent Windows information appears in “Windows fundamentals” in the *MAT Common Services User Guide*.

There are two levels of access to the MAT system:

- *Administrator* access allows unrestricted use of the MAT system and its functions. The system administrator configures the MAT system, sets up the connections to the Meridian 1, and defines user access to MAT system modules.
- *User* access allows the user to examine data and produce reports.

Conventions used in this manual

This manual uses the following terms:

- *Computer system* refers to the hardware and software of an IBM-PC™ or 100% compatible PC.
- *Disk* refers to a high capacity hard disk, required by the MAT system.
- *Windows* refers to Microsoft Windows™ version 3.1 or later.
- *DOS* and *MS-DOS* refer to Microsoft DOS™ version 5.0 or later.
- *Mouse* refers to any standard PC pointing device. Common mouse actions include *point*, *click*, and *double-click*.
- Standard Windows terminology includes *icon*, *window*, *dialog box* (*dialog* in this document), and *menu*.

This manual uses the following typographical conventions:

- Angle brackets denote a single keyboard key. For example, <Esc> denotes the Escape key, labeled Esc on PC keyboards. A series of angle brackets denote keyboard keys to use simultaneously. For example, <Ctrl><Alt> denotes the key sequence for rebooting a PC.
- **This font** is used to designate buttons, menu choices, and information you are to enter.

Traffic Analysis System Sizing Guidelines

System sizing for Traffic Analysis must consider several factors to insure adequate capacity and throughput to retrieve, store, and report traffic data. The major factors are:

- 1 Does the system have enough free disk space to store and maintain the traffic data?
- 2 Is there sufficient communications bandwidth to perform traffic data collection from all sites in time?
- 3 Does the system have sufficient resources to provide reports on time?

Traffic Database Capacity

The size of the Traffic Database varies greatly from configuration to configuration depending on the Meridian 1. The Traffic Database will also grow rapidly depending on how much data is kept for reporting purposes. Since the active database should normally be archived monthly, retaining the previous month's traffic data for reporting as well as updating statistics on the current month, one should expect to hold about two months of data on the Traffic Database. Older data should routinely be archived and moved to external storage. Since, however, it will normally be stored transiently on disk as well, you should reserve capacity for the archive operation.

The actual size of the database depends on various configuration parameters such as the number of loops, trunks, consoles, etc. The following formula may be used to estimate the size of the Traffic Database, including a one-month archive:

$$24 \text{ hours} \times (61 \text{ days} + 31 \text{ days of archive}) = 2208 \text{ samples.}$$

Thus, we allow for 2,500 samples to include temporary files used during reporting. In the calculations below, all figures are in bytes:

$$\begin{aligned} \text{Traffic Database Sample} = & [(\text{Loops} \times 35) + (\text{Junctures} \times 12) + \\ & ((\text{C/S Links} + \text{A/M Links}) \times 348) + (\text{D-Channels} \times 102) + \\ & (\text{Multipurpose ISDN Signaling Processors} \times 44) + (\text{Customers} \times 456) + \\ & (\text{Routes} \times 69) + (\text{Attendants} \times 34) + (\text{Network Classes of Service} \times 30) + \\ & (\text{Trunk Groups} \times 30)] \end{aligned}$$

Communications Throughput

The amount of time that it takes a system to collect traffic data depends on the number of sites to collect, the Meridian 1 configuration, the communication line speed, and the number of communication ports available on the MAT system.

Traffic data is produced hourly by the Meridian 1. This data is either collected hourly by the TAM system from the Meridian 1 or daily from an optional data buffer device that stores the hourly data and is connected to the Meridian 1. Once retrieved, the data is compressed by a 4-1 ratio for reporting. Having calculated the size of the database sample, you can calculate the time required to transfer the data. These calculations allow for dialing, connection, logon, traffic data requests, logout, and disconnect.

— No buffer device—hourly:

Seconds to Collect Sample = [Setup + (Compression Ratio x Size of Traffic Sample) ÷ Modem Speed]

— With a buffer device—daily:

Seconds to Collect Sample = [Setup + (Hours per Day x Compression Ratio x Size of Traffic Sample) ÷ Modem Speed]

Note: For both cases, allow 40 seconds for setup and allow 85% throughput on modem speed for buffer protocol.

The goal is to ensure that the time required to collect data from all sites, using all available communications paths, is less than the interval between collection cycles. Note that modem speeds are typically rated by baud rate—which roughly translates to bits per second. As a rule of thumb, use 10 bits per byte in calculating modem speed. A 2400 baud modem delivers about 240 bytes per second.

Sample Calculation

Here is an example of a Traffic Database sizing and a communication throughput estimate for a single site:

Switch Option 61 + 2400 baud modem (no buffer device)

7 Loops	x 35	= 245
1 Junctor	x 12	= 12
1 Link	x 348	= 348

0 D-Channels	x 102	= 0
0 MISP's	x 44	= 0
1 Customer	x 456	= 456
9 Routes	x 69	= 621
1 Attendant	x 34	= 34
0 NCOS's	x 30	= 0
2 Trunk Groups	x 30	= 60
		1,776 bytes total
Disk Requirements	= 2,500 x 1,776	
	= 4,440,000 bytes (assuming two months on-line)	

Hourly:

$$\begin{aligned}\text{Data Collection Duration} &= 40 + (4 \times 1,776) \div (240 \times 0.85) \\ &= 75 \text{ seconds} = 1:15 \text{ minutes each hour}\end{aligned}$$

Daily:

$$\begin{aligned}\text{Data Collection Duration} &= 40 + (24 \times 4 \times 1,776) \div (240 \times 0.85) \\ &= 876 \text{ seconds} = 14:36 \text{ minutes each day}\end{aligned}$$

System Resources

The resources required to produce timely reports are provided by the Windows environment and are affected by activities on the system. System loads use CPU, memory, disk storage, and bandwidth. A typical application such as word processing or electronic mail might generate little CPU load, but might put large demands on memory.

In any Windows environment, memory (RAM) can be extended through the use of virtual memory. Virtual memory allows the computer to use disk space as if it were RAM. Both RAM and virtual memory must be available in sufficient quantity for all concurrent system activities. A shortage of memory will either prevent an application from running or will slow the overall system. The minimum configuration for Traffic Analysis is 4 MB of RAM, and at least 6 MB of virtual memory.

CPU loading depends on the frequency and number of reports. While the system is designed to concurrently generate multiple reports, the system runs at maximum throughput when generating one report at a time. You can facilitate throughput by using the task scheduler. If multiple reports are concurrently active nevertheless, the file sharing features of TAM ensure that the correct data is supplied for each report.

The Windows Print Manager ensures that data from separate reports are not mixed-up on the printer. In order to perform this function, the Print Manager temporarily stores reports on disk (the Print Manager has a backlog limit of 99 print jobs). Thus, CPU speed, available virtual memory, and printer speed dictate the time required to produce the reports and the practical system limits to traffic data throughput.